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## **ERT method in the study of chemical pollution of the hydrogeological environment – numerical analysis of 2D and 3D models**

### **Abstract**

Electrical resistivity tomography (ERT) method is often used to solve problems related to chemical pollution of the hydrogeological environment. The source of such contamination can be e.g. industrial heaps, settling ponds and municipal landfills. The contaminants spreading often takes the form of a (3D) pollution cloud. In this case, the standard interpretation of 2D ERT surveys may be difficult. In order to show the specificity of pollutants propagation, numerical modelling was carried out. Both 2D and 3D models were analysed. Those refer to the real geological situation – vicinity of Nowa Huta (Krakow, Poland) – where heaps and settling ponds of the metallurgical plant are present. An appropriate geoelectrical model referring to the above situation was prepared. It was assumed that highly mineralized waters in the form of a contamination tongue are spreading within the aquifer. Resulting interpreted resistivity distributions for 2D and 3D variant of ERT method were analysed. It has been shown that the method is promising in terms of the ability to detect and assess the nature of the transitional zone between clean and contaminated waters. Additionally, it has been shown that 3D modelling can be a useful, complementary element in interpreting the results of DC resistivity methods.